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# Preventing falls and fall-related injury in older people

## How GPs can help

### Key points

- GPs have a key role in screening and assessment of risk for falls in older people.
- GPs have direct responsibility for medication use and the prescription of drugs that both increase and decrease risk of falls and fractures.
- Medications to be avoided in the older person where possible are the centrally acting medications, especially sedative hypnotics, antidepressants, antipsychotics and opiate-containing analgesics.
- Exercises that challenge balance are important for falls prevention and must be undertaken on an ongoing basis. The benefits of appropriate exercise should be conveyed to patients, particularly to those who have chronic diseases for which different approaches to exercise are required.
- Residents in residential aged care should be seen as at high risk of falls. At a very minimum, all residents should be vitamin D replete. Several additional strategies can be used to reduce both falls and fracture risk.

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Falls and fall-related injury are common in older people, with some events having a direct impact on the person's ability to function and live independently. There is good evidence that falls and fall-related injury can be prevented, and GPs have a key role in screening, assessment and implementing effective intervention strategies.

### THE SIZE OF THE PROBLEM

Falls are the leading cause of injury-related hospitalisation and injury-related death in persons aged 65 years and above. In a study undertaken in New South Wales, Australia, it was shown that 17% of all presentations of older people to the emergency department were fall-related and, of these, about 50% were admitted to hospital.<sup>1</sup> Falls are also the most common reason why an older person calls for an emergency ambulance and the most frequently cited reason for admission to residential aged care. A fall may be a manifestation of acute or chronic underlying pathology or an unintended event resulting from the interaction of a person with his or her surrounds (such as tripping on a pavement).

There is a wealth of literature, including


Australian national guidelines,<sup>2</sup> that guide us to the most effective strategies that can be used to prevent falls and injury. However, despite the evidence, there is still a large number of older people in Australia at risk of falls who are not being appropriately assessed or offered interventions to minimise risk.

### CASE SCENARIO

*Mrs A, aged 78 years, has been brought to the emergency department by ambulance, having tripped on a tree root while out shopping. She has sustained a left distal forearm fracture, which is reduced and then put in a back slab pending outpatient orthopaedic review. Mrs A's husband is willing and able to help her with both domestic and personal care for the period that her arm is out of action and so she is*

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**QUICKSCREEN® CLINICAL FALLS RISK ASSESSMENT FORM AND TESTS\***




**QUICKSCREEN® Clinical Falls Risk Assessment Form**


NAME \_\_\_\_\_ DATE \_\_\_\_\_

*For the following risk factors score 'YES' if risk factor is present, score 'NO' if risk factor is not present*


MEASURE	RISK FACTOR PRESENT? (please circle)	ACTION		
<b>Previous Falls</b>				
One/more in previous year	Yes/No			
<b>Medications</b>				
Four or more (excluding vitamins)	Yes/No			
Any psychotropic	Yes/No			
<b>Recommendation:</b> Review current medications				
<b>Vision</b>				
Low contrast visual acuity test Unable to see all of line 16	Yes/No			
<b>Recommendation:</b> Give vision information sheet. Examine for glaucoma, cataracts and suitability of spectacles. Refer if necessary.				
<b>Peripheral Sensation</b>				
Tactile sensitivity test Unable to feel 2 out of 3 trials	Yes/No			
<b>Recommendation:</b> Give sensation loss information sheet. Check for diabetes.				
<b>Strength/ Reaction Time/ Balance Time (secs)</b>				
Near tandem stand test Unable to stand for 10 secs	Yes/No			
Alternate step test Unable to complete in 10 secs	Yes/No			
Sit to stand test Unable to complete in 12 secs	Yes/No			
<b>Recommendation:</b> Give strength/balance information sheet. Refer to community exercise class or home exercise program if appropriate to individual level of functioning.				
Number of risk factors	0-1	2-3	4-5	6+
Probability of falling	7%	13%	27%	49%




**Low contrast visual acuity test**  
Read all of the letters on the third line (line 16)




**Tactile sensitivity test**  
Must feel at least two of the three trials



**Near tandem stand test**  
Stand for 10 seconds with eyes closed



**Alternate step test**  
Eight foot taps. Must complete within 10 seconds



**Sit to stand test**  
Five repetitions with arms folded. Must complete within 12 seconds

\* The NeuRA QuickScreen® clinical falls risk assessment form and tests, developed by researchers at Neuroscience Research Australia (NeuRA), is a multifactorial assessment tool designed specifically for use in clinical settings. Reproduced with permission from Neuroscience Research Australia.

*discharged from the emergency department with simple analgesia and told to go to her GP for further assessment of falls and fracture risk.*

**WHAT CAN THE GP DO?**

By virtue of the fact that Mrs A has fallen and sustained a fracture, there is no requirement to screen her for falls risk. Instead, an assessment looking for modifiable risk factors and tailored intervention is required.

**How to identify who is at risk of falls**

Screening is a process that aims to identify people at increased risk of falls. It does not necessarily tell you why someone is at risk of falls. It should be a simple and quick process. For busy GPs, the simplest screen to use in older people is to ask them whether they have fallen two or more times in the past year or have sustained a significant

**TABLE 1. EXAMPLES OF LINKING ASSESSMENT TO EVIDENCE-BASED INTERVENTIONS**

Risk factor	Intervention
Medication	Stop any CNS medication unless ongoing clinical indication Ensure calcium and vitamin D intake is sufficient and if not, consider supplementation. Aim for serum vitamin D level >50 nmol/L Offer treatment for osteoporosis for any older person sustaining a fracture from standing height unless there is a clinical contraindication to all the therapies available Refer for home medication review if concerns about management of medications
Vision	If cataracts are causing impaired vision, refer for extraction If using bifocal or multifocal glasses – recommend use of a separate pair of single lens glasses for use outdoors
Impaired balance or mobility	Consider home- or group-based strength and balance training program Ensure any underlying cause for impaired balance and mobility is addressed where possible – e.g. vitamin D deficiency, vitamin B <sub>12</sub> deficiency, CNS medication use, pain, etc.
Syncope/dizziness	Check lying and standing blood pressure Review any medications contributing to orthostatic hypotension Consider Epley manoeuvre if dizziness thought to relate to benign paroxysmal positional vertigo Refer if unexplained dizziness and/or syncope
Painful feet	Treat pain and consider referral to podiatrist and for provision of ankle strengthening and mobility exercises
Cognition	Document cognitive performance using a simple tool – e.g. GPCog, AMTS or MMSE Consider the impact of any cognitive deficits on ability to engage in an intervention
Environment	Refer to occupational therapist for modification of the home environment with provision of support and advice regarding safety within and outside the home for those at highest risk of fall

ABBREVIATIONS: AMTS = abbreviated mental test score; CNS = central nervous system; GPCog = general practitioner assessment of cognition; MMSE = mini-mental state examination.

injury from a fall.

There is a multitude of other screening tests available, but the reality is that few have been properly evaluated for reliability and predictive validity and anecdotal information suggests that GP uptake is poor.

**How best to identify risk factors for falls**

The purpose of assessment is primarily to identify modifiable risk factors for falls and fractures and then to implement effective intervention strategies based on the risk factors identified. The

process needs to be systematic and for this it is advised to use a validated assessment battery.

QuickScreen is a validated risk-assessment tool developed by researchers at Neuroscience Research Australia for use by practice and rural nurses, allied health workers and GPs. It allows the clinician to estimate the level of increased fall risk and determine which sensorimotor systems are impaired. It consists of measures that include information on previous falls, medication use, vision, peripheral sensation, lower limb strength, balance and co-ordination. The test takes approximately 10 minutes to perform and allows for assessment to be clearly linked to intervention (see the box on page 25).

An alternative to QuickScreen is the Falls Risk for Older People – Community setting (FROP-Com), which is a detailed fall risk factor assessment tool developed by the National Ageing Research Institute. It includes 26 questions on 13-risk factors, with either dichotomous (0 to 1) or ordinal (0 to 3) scoring. A total of the individual scores provides an overall score of fall risk (range 0 to 60), with higher scores indicative of greater risk. The tool includes guidelines on scoring each risk factor, and evidence-based referral or interventions. No special equipment is required. The full FROP-Com and its guidelines are available from the National Ageing Research Institute’s website (<http://www.mednwh.unimelb.edu.au/research/Tools-and-Resources.htm>).

**CASE CONTINUED**

*The practice nurse assessed Mrs A and identified several risk factors that required further consideration. Mrs A was taking several medications for a number of underlying comorbidities. Her medications included an antidepressant and sedative hypnotic. The practice nurse also noted that Mrs A wore bifocal glasses and that her balance was poor when tested.*



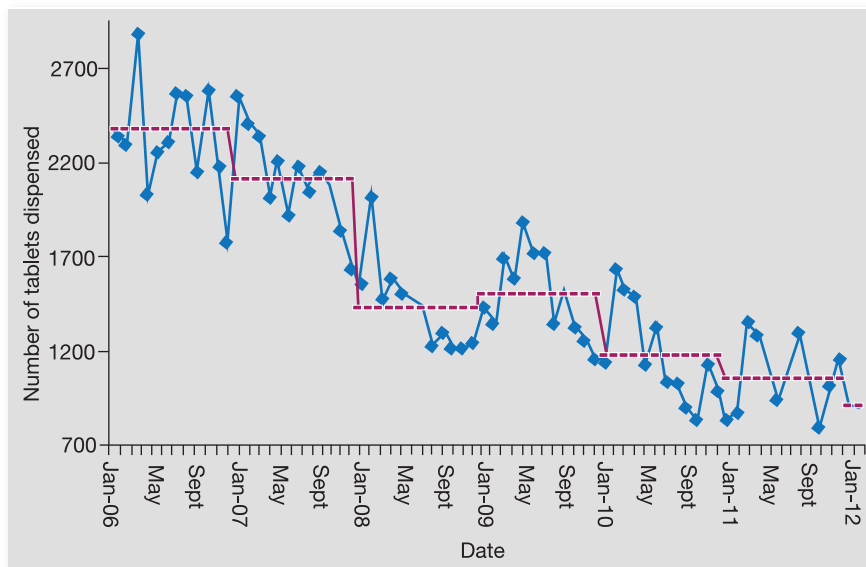


Figure 1. Reduction in sedative hypnotic use occurring over time in a large metropolitan teaching hospital in Sydney following the introduction of a sustained training, education and support program aimed at reducing in-patient falls. Graph shows the total number of sedative tablets dispensed in all medical and surgical wards between January 2006 and January 2012 [unpublished data].

### WHO DOES WHAT WITH THE INFORMATION?

GPs have a key role in both identifying and addressing a number of risk factors for falls in older people. Some interventions clearly sit within the realm of the GP, whereas others may require referral to other health care professionals. The older person must be an engaged and active participant in the suggested recommendations.

Table 1 highlights several of the more commonly identified risk factors for falls with suggested interventions.

### Review of medications

Probably the most important role of the GP in relation to falls and fracture prevention is prescribing practice – stopping the bad medications and starting the good medications. There is a consistent body of literature linking centrally acting medications – sedative hypnotics, antidepressants, antipsychotics and opiate-containing analgesic agents – with an

increased risk of falls and fractures. Sedative hypnotic use is also linked with motor vehicle accidents and, more recently, has been shown to be associated with and increased mortality and cancer risk.<sup>3</sup> Clearly, some people have justifiable clinical indications for some of these medications, but ongoing need should be reviewed regularly. In addition, abrupt withdrawal of any of these medications is contraindicated and many would see withdrawal as a futile exercise unless the older person is a willing participant and has a full understanding of the nature of the risk of such medication use.

Hospitals also have a responsibility for reducing the use of sedative hypnotics. Figure 1 shows the results of a sustained training, education and support program aimed at reducing in-patient falls and which included targeted teaching around the risks of sleeping tablet use at a large metropolitan teaching hospital in Sydney.

In addition to stopping older patients

from taking harmful medications, doctors have a requirement to ensure that people are taking medications from which they stand to benefit. Many older people are vitamin D deficient from a combination of limited sunlight exposure and a reduced ability to synthesise vitamin D in the skin. Vitamin D receptors are found on muscle (including cardiac myocytes) and nervous tissue, and there is evidence that vitamin D replacement to achieve serum levels in excess of 50 nmol/L can reduce falls in older people. Low levels of vitamin D are also associated with increased risk of cardiac events and certain malignancies,<sup>4</sup> so there are multiple reasons to ensure that people are vitamin D replete.

Both vitamin D and calcium are essential for bone health, and when dietary intake is insufficient, these should be supplemented. However, neither are mainstay treatments for osteoporosis and all too often people who fall and fracture are not offered evidence-based treatments for osteoporosis. A recent editorial comment in *Australian Family Physician* highlighted the ubiquitous nature of the secondary prevention fracture care gap.<sup>5</sup> There is no requirement to undertake a bone mineral density (BMD) scanning in an older person who has sustained a low trauma fracture. Several treatment options exist for osteoporosis, and these should be considered in any older person with a low trauma fracture or at high risk of fracture (e.g. people taking high doses of corticosteroids). Table 2 lists the medications currently available on the PBS for osteoporosis.

### Review of use of bifocal or multifocal glasses

The use of bifocal and multifocal glasses has been shown to increase the risk of falls and evidence also exists to support people using single lens glasses for outdoor mobility. The wearing of bifocal or multifocal glasses is particularly hazardous during stair descent, where the varying focal lengths can lead to inaccurate foot placement.

**TABLE 2. PBS TREATMENT OPTIONS FOR OLDER PEOPLE WITH LOW TRAUMA FRACTURE**

Treatment	Administration	Comments
Bisphosphonates	Can be given orally (alendronate and risedronate) on a weekly or monthly basis or intravenously (zoledronic acid) on an annual basis for three years Avoid in people with impaired renal function (creatinine clearance <35 µmol/L) Check dentition and any requirement for dental work – rare association with osteonecrosis of the jaw Ensure people are calcium and vitamin D replete before administering treatment	PBS listed for males and females
Strontium ranelate	Given orally on a daily basis Caution required if renal impairment	PBS listed for females only
Raloxifene	Given orally on a daily basis Caution required if renal impairment Main concern relates to increased risk of venous thromboembolic disease	PBS listed for females only
Denosumab	Administered subcutaneously every six months for 36 months Can be used in people with renal impairment Longer term side effects uncertain and some concern about increased risk of infection due to mechanism of action	PBS listed for females only
Teriparatide	Daily subcutaneous injection for 18 months	Specialist prescription only for those who have failed on other treatments

Many older people when told about the hazards of wearing bifocal and multi-focal glasses outdoors will respond by telling the practitioner that they have been wearing them for years. Although true, what will have changed over the years are basic physiological measures of strength, balance and reaction time, which have a direct impact on the ability to respond to a sudden and unexpected challenge to remaining upright.

### Assessment of postural hypotension

Postural hypotension and associated symptoms are often related to the use of antihypertensives and other cardiac medications. Postural hypotension should be properly assessed with the person lying supine for five minutes and then on standing at one and three minutes. Any changes in pulse and blood pressure

should be correlated with symptoms.

When choosing which medications to stop in patients with postural hypotension, most doctors with expertise in the area would recommend stopping peripheral vasodilators and volume-depleting agents if clinically appropriate. In some older people, who still have symptomatic postural hypotension despite modifying medications and using standard non-pharmacological treatments, the use of drugs such as fludrocortisone or midodrine (an alpha-agonist) are required. Fludrocortisone can be helpful but has the main side effect of causing peripheral oedema. In those with central dysautonomia, such as that seen in some people with Parkinson's disease, the use of a drug such as midodrine is required, although this tends to be reserved for specialist use and is not currently licensed in Australia.

### Referral by the GP

As the primary provider of care on an ongoing basis, GPs are in the privileged position of being able to influence the health decisions of their patients. When considering this relationship for falls prevention, it is critical that the GP is proactive in referring older people to evidence-based treatments to minimise falls risk.

Exercise is probably the single most important intervention that a person can undertake to reduce the risk of falls and fall-related injury. However, the exercise needs to specifically challenge balance and preferably also improve strength. It also needs to be sustained on an ongoing basis. Simply advising someone to walk is not an evidence-based approach and in those with poor balance, may actually increase falls risk. Examples of evidence-based exercise interventions include the



Figure 2. Exercise to reduce the risk of falls needs to specifically challenge balance and preferably also improve strength. Tai Chi is an example of a suitable evidence-based exercise intervention to help reduce falls.

Otago exercise program (a progressive exercise program that includes strengthening and balance exercises) and Tai Chi (Figure 2), both of which can be undertaken on a one-to-one basis or in a group setting, depending on patient preference and availability of services locally.

More recent evidence has emerged on the importance of good foot care and footwear. Painful feet can increase falls risk and there is evidence to support podiatry intervention and the provision of specific ankle/foot exercises.<sup>6</sup>

Referral for other specialist input may be required and may include referral for:

- cataract extraction
- occupational therapy home assessment
- a home medication review (HMR) when there are particular concerns about compliance and ability to manage medications.

In some areas, it will be possible to refer older people to a specialist falls clinic, although the availability of these services is highly variable.

## SUGGESTED RESOURCES

- Preventing falls and harm from falls in older people: best practice guidelines for Australian hospitals, residential aged care facilities and community care. Sydney: Australian Commission Safety and Quality in Health Care; 2009. Available online at <http://www.safetyandquality.gov.au/publications-resources/publications/?t=G> (accessed June 2012).
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## CASE CONTINUED

*When the GP met with Mrs A, they addressed a number of issues relating to her identified falls risk profile. This was done over a number of visits rather than overwhelming Mrs A with a large number of recommendations in one session.*

*The antidepressant and sedative hypnotic had been started a number of years ago after the death of Mrs A's daughter. It was agreed that Mrs A would reduce and then discontinue her antidepressant in the first instance and that this would be reviewed again with the potential to slowly reduce and stop the sedative hypnotic.*

*Her use of bifocals was discussed and advice given to use single lens glasses when outdoors. She was happy to make this change as she was aware herself of the distorted visual fields when attempting stair descent.*

*As her arm was still in a cast, she was reluctant to consider an exercise program at this point in time but was happy to do so in the future.*

*The GP also discussed bone health with Mrs A. She already had sufficient calcium intake in her diet and was taking vitamin D supplements. When offered*

*the choice of treatments for osteoporosis treatments, she opted for an intravenous bisphosphonate.*

## PREVENTING FALLS IN NURSING AND RESIDENTIAL AGED CARE FACILITIES

Falls and fall-related injury are more common in residential aged care facilities and it is arguable that there is no indication for screening in this population as all residents are likely to be at increased risk of falls. Interestingly, it should not be assumed that there is a linear relation between falls risk and degree of 'frailty' as those least likely to fall are those who are most 'frail' – i.e. unable to transfer or mobilise without assistance.

As with the community population, assessment should be linked to intervention and several approaches have been shown to be effective in this population. Vitamin D supplementation is a single and simple intervention for which there is evidence of benefit in terms of preventing falls in people living in residential aged care facilities, particularly in those with low serum levels of vitamin D (<50 nmol/L).<sup>7</sup>

Other interventions shown to be

effective involve a multifaceted assessment of risk, including factors specific to the individual (cognition, physical function, medication use, hydration) as well as an assessment of how the person interacts with his or her surrounds (distance to toilet or dining area, adequate lighting at night, etc).

People living in residential aged care settings are at high risk of fracture and, despite this, they are often the population least likely to be considered for treatment of osteoporosis.<sup>8</sup> There is limited evidence to support interventions to prevent falls in people with dementia but no reason to believe that they would not achieve the same fracture reduction benefits from pharmacological treatment of their bone health. Clearly the decision to treat should be individually based and made in the context of the global health of an individual, including potential life expectancy.

## CHALLENGES TO IMPLEMENTING THE EVIDENCE

Despite the evidence supporting fall risk-factor assessment and intervention, the literature suggests that assessment is not routinely undertaken and that people with the potential to benefit from falls and fracture interventions are not receiving this level of care.<sup>8</sup>

The multifactorial nature of falls and the need to assess multiple domains and to involve several healthcare professionals can seem overwhelming for both the patient and the person undertaking the initial screen or assessment. Time pressures are a reality for the GP and it may be necessary, as well as more appropriate, to address one risk factor at a time and review progress in subsequent consultations. Many older people do not openly embrace the need for specific targeted exercise on an ongoing basis and it is crucial that all health practitioners describe and prescribe exercise as a life-long activity with many health benefits, including falls and fracture prevention.

There is still limited evidence of effectiveness for fall prevention strategies in some high-risk populations, including people with dementia, Parkinson's disease, depression and stroke, although research is ongoing in all of these areas.

## CONCLUSION

GPs have the potential to have a huge impact on an older person's risk of falls and fall-related injury. This in turn can have a dramatic effect on an older person's ability to function and live independently and their quality of life. To date, and despite evidence and guidelines, there is limited evidence to show that systematic screening, assessment and intervention is happening across Australia and the rest of the world. More work is required to better understand the barriers to delivering effective falls prevention strategies in general practice and appropriate levels of support to implement best practice. The benefits are compelling from a patient perspective – fewer deaths, fewer fractures and fewer moves to residential care.

MT

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COMPETING INTERESTS: None.

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